

REMARKS

Claims 1, 3, 5-6, and 9, are pending in this application.

Claims 2, 4, and 7-8, have been cancelled without prejudice.

Claim 1 has been amended to incorporate the limitations of claims 2 and 4. Claims 3 and 5-6 have been amended to correct claim dependency. New claim 9 is dependent on claim 1, and has been added to recite that the surface layer is fusion bonded directly to the foam layer. Support for claim 9 is found on page 13, first complete paragraph, and pages 14 and 15. Support for the claims as amended appears throughout the specification and claims as originally filed. No new matter has been added.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached pages are captioned "**Version with markings to show changes made**".

Favorable reconsideration is respectfully requested.

I. At page 2 of the Official Action, claims 1 and 6, have been objected to, because of informalities.

The Examiner states that in claim 1, line 5, should be corrected by inserting the word "to" between "particles" and "one", and that claim 6, line 2, needs to be corrected to recite "the" between "constituting" and "surface". Claims 1 and 6 have been amended to correct the noted informalities. Thus, it is submitted that this objection is moot.

II. At page 3 of the Official Action, claims 1-8, have been rejected under 35 USC § 103 (a), as being unpatentable over Ito et al. (US Pat. No: 5,476,618) in view of JP 10-077359 (US Pat. No: 6,027,806).

The Examiner contends that it would have been obvious to the skilled artisan at the time the invention was made to combine the teachings of Ito and JP '359, motivated by the desire to produce a molded resin laminate with reduced molding temperatures and improved mechanical and thermal properties. The Examiner further states that neither Ito nor JP '359 disclose the present compressive hardness value or the void fraction value of their expanded bead resin foams, but that the expanded bead resin foam of Ito in view of JP '359, appears substantially identical to the present foam layer, and thus the Examiner takes the position that the expanded bead resin form of Ito in view of JP '359 would inherently possess a compressive hardness and a void fraction within the claimed range. Lastly, the Examiner states that the present hardness and void fraction would have obviously been present once the expanded bead resin foam of Ito in view of JP '359, was provided. In view of the following, this rejection is believed to be overcome.

Ito teaches a thermoplastic resin sheet (base material 3) that is interposed between the skin layer and the foam bead layer. This thermoplastic resin sheet is an adhesive layer between the skin layer and the foam bead layer, and is critical to Ito. Ito teaches that prior art laminates are problematic in that they include complex manufacturing processes, exhibit undesirable roughness due to uneven application of conventional adhesives (col. 4, lines 44-47), require conventional adhesives, exhibit poor adhering strength (col. 1), and others. Ito states that his invention solves these problems by providing a laminate having a "thermoplastic resin sheet" (See col. 3, lines 1-18).

Ito discusses the advantages of his laminate at col. 4, lines 37-55. Ito states that the thermoplastic resin sheet has a low glass transition temperature, thus becoming "adhesive" at a relatively low temperature (col. 4, line 39). Ito recites that his method is advantageous because

using the thermoplastic resin sheet does not require application of an adhesive as used in conventional processes (col. 4, lines 42-44). Ito also recites that the use of the thermoplastic sheet provides for a simplified manufacturing process, and results in a skin layer free from undesirable roughness. Lastly, Ito states that the thermoplastic sheet is effective to cover irregularities or roughness on the surface of the foam layer, and thus improving the appearance of the resin laminate.

Further, the laminate of Ito cannot be produced without the thermoplastic sheet because without it, the skin layer and the foam layer cannot be thermally bound at a low temperature. However, should the temperature for thermal bonding be raised, Ito teaches that the heat causes the skin layer to deform and lose its shape. Accordingly, the thermoplastic resin sheet is essential to and required by Ito.

JP '359 is directed to expanded resin beads which include a core including thermoplastic resin in an expanded state, and a coat including an ethylene-based polymer which has a lower melting point than the thermoplastic resin or has substantially no melting point, and the coat is in a substantially unexpanded state.

The present invention is directed to a laminate body including a surface layer, a foam layer and an optional base layer. Claim 1 has been amended to include the limitations of claims 2 and 4. Specifically, claim 1 recites that the polyethylene resin coat covering the core is in a substantially non-expanded state, and where the foam layer has a compressive hardness of from 0.05 to 0.7 Mpa. New claim 9 has been added and recites that the surface layer is fusion bound directly to the foam layer. The present composite does not require an adhesive layer.

The Examiner states that it would be obvious to combine the teachings of Ito and JP '359, motivated by the desire to produce a molded resin laminate with reduced molding temperatures and improved mechanical and thermal properties.

Regarding claims 1-3, 5 and 6, it is submitted that a proper case of *prima facie* obviousness has not been established. A proper case of *prima facie* obviousness under 35 U.S.C. §103, requires that the prior art as a whole, must suggest the desirability of making the claimed combination and provide a reasonable expectation of success. Further, a prior art reference may be said to *teach away* when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant.

Ito does not teach or suggest a laminate absent a thermoplastic resin sheet. Ito *teaches away* from any laminate absent a thermoplastic resin sheet because Ito *requires* a thermoplastic resin sheet in order to achieve the objects of his invention, namely, surface regularity, simple manufacturing process, no conventional adhesive, and improved appearance.

Specifically, a skilled artisan confronted with the same problems as the inventor, i.e., producing an improved laminate, and with no knowledge of the claimed invention, would have no motivation to select the laminate of Ito including a skin layer, a foam layer and a base layer, and the expanded bead foam of JP '359, let alone combine them as claimed, having the claimed compressive hardness. In fact, Ito *teaches away* from the claimed invention, because one of ordinary skill in the art in view of Ito would be *led away* from the path taken by Applicant's, that is, the skilled artisan would be led away from a laminate not including a thermoplastic resin sheet, because Ito teaches that in order to achieve a laminate having good surface quality, etc., the thermoplastic resin sheet is required.

Neither Ito nor JP '359, taken alone or together, suggest the desirability of modification of their respectively disclosed laminates and expanded bead foam, to achieve the claimed laminate not requiring an adhesive layer, let alone a laminate having the claimed compressive hardness. Regarding claim 9, neither Ito nor JP '359 suggest a laminate where the surface layer is directly fusion bonded to the foam layer, as presently required. Thus, one of ordinary skill in the art,

faced with the problem of producing an improved laminate, would have no reason to select the expanded bead foam of JP '359 to employ with the laminate of Ito.

Further, assuming *arguendo* such motivation to select present, the invention would not be achieved since neither of the references suggest a laminate absent an adhesive layer. At most, the combination of Ito and JP '359, would produce a laminate including expanded resin beads bound to a surface layer via a thermoplastic resin sheet. Again, Ito *requires* a thermoplastic resin sheet. Further, Ito does not teach or suggest the presently claimed compressive hardness.

JP '359 does not cure the deficiencies of Ito, since JP '359 also does not suggest a laminate absent an adhesive layer, or the claimed compressive hardness. Neither of Ito nor JP '359, taken alone or together, suggest the desirability of modification of their respective disclosures, to achieve the claimed laminate not requiring an adhesive layer, and having the claimed compressive hardness (claim 1) nor a laminate where the surface layer is fusion bound directly to the foam layer (claim 9).

Regarding the claimed compressive hardness, it is the present inventors who have surprisingly discovered that providing core sheath beads having a compressive strength of from 0.05 to 0.7 MPa results in a laminate having high mechanical strength, good surface qualities, and good bonding between the surface layer and the foam layer. When the compressive hardness is less than 0.05 MPa, the foam layer becomes too soft, bonding between the surface layer and the foam layer is insufficient, and the surface layer wrinkles. Alternatively, when the compressive hardness exceeds 0.7 MPa, the foam layer is too hard and traces of foam particulate are produced, thus causing surface layer irregularity. Please see the specification at page 11, lines 16 to page 12, line 1.

In view of the arguments set forth above, and the newly presented claims, it is submitted that a proper case of *prima facie* obviousness has not been established, and further that nothing in the cited references, taken alone or together, render the claimed invention obvious within the

US Pat. Appl. Ser. No: 09/839,716
Conf. No: 2767
May 29, 2003
Page 8

meaning of 35 USC § 103 (a). Accordingly, the Examiner is respectfully requested to withdraw this rejection.

In view of the amendments to the claims, and the arguments set forth above, allowance of this application is respectfully requested.

If the Examiner has any questions regarding this Response, the application in general, or has any suggestions for placing the application in condition for allowance, the Examiner is requested to call the undersigned at the number listed below.

Respectfully submitted,

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Version with markings to show changes made

1. **(Amended)** A polyolefin resin molding composite comprising
a surface layer and a foam layer, or a surface layer, a foam layer, and a base member,
the foam layer being produced by fusion bonding thermoplastic expanded resin
particles to one another by molding, the thermoplastic expanded resin particles comprising
a core that is made of a crystalline thermoplastic resin and is in an expanded state, and a
polyethylene resin coat covering the core that is in a substantially non-expanded state,
wherein the foam layer has a compressive hardness of from 0.05 to 0.7 MPa; [,] and
the surface layer comprising a thermoplastic synthetic resin having a melting point
of 5°C or more higher than a melting point of the polyethylene resin constituting the coat of
the particles.
3. **(Amended.)** The [A] polyolefin resin molding composite according to claim 1 [2], wherein
the polyethylene resin coat comprises an ethylene polymer having a melting point lower than
the crystalline thermoplastic resin constituting the core, or an ethylene polymer that
substantially exhibits no melting point.
5. **(Amended.)** The [A] polyolefin resin molding composite according to claim 3 [4], wherein a
void fraction of the foam layer is 1 to 40 %.
6. **(Amended.)** The [A] polyolefin resin molding composite according to claim 3, wherein the
thermoplastic synthetic resin constituting the surface layer is a polyolefin resin.

Art Unit: 1771

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Imr

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